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GARDERE / JHTL
GARDERE WYNNE SEWELL, LLP
1601 ELM STREET
SUITE 3000
DALLAS, TX 75201

EXAMINER	
ROBINSON, LAUREN E	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/551,873	ZARB ET AL.	
	Examiner	Art Unit	
	LAUREN ROBINSON	1784	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 June 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *38,40,43,44,47,48,50-54,56,58,65,69-71 and 76-114* is/are pending in the application.

4a) Of the above claim(s) *38,40,43,44,47,48,50-54,56,58,65 and 69-71* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *76-114* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *S6/2010*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 4, 2010 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 76-110, 113 and 114 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 76, 82-83, 86, 92-93, and 94 are rejected for being unclear as they recite "the carbonation reducing sealer".

Specifically, although claim 76 recites "a carbonation reducing sealer", the claim further recites on a first and second surface. Therefore, there are technically two carbonation reducing sealers present and it is unclear when claims 76, 82-82, 86, 92-93 and 94 recite "the...sealer", which one they are referring. The examiner suggests for clarity purposes that the claims should indicate which surface sealer the claims are referring.

For applying prior art, the claims reciting "the sealer" are interpreted to mean the first face sealer, the second face sealer and/or both.

Claims 77-81, 84-85, 87-91 and 95-110 are rejected for being dependent on above claim 76.

Claims 78 and 113 are rejected for reciting the sealer on all surfaces of the product. Specifically, these claims depend on claims 76 and 111 which recite that the product "includes" the sealer therein but claims 78 and 113 suggest that the sealer does not comprise the product but instead, the sealer is placed on the outer surface of the product making the claim unclear.

For purposes of applying prior art, the claims are interpreted to be the sealer covering all surfaces of the cement within the product.

Claim 114 is rejected for being dependent on claim 113.

Claim 95 is also rejected for being unclear as it recites "a cured product" being selected. It is unclear as to whether the product of claim 76 is supposed to be cured or whether an additional cured product is chosen, etc.

For applying prior art, the claim is interpreted as the product of claim 76 being a cured product.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 76, 79-83, 85-86, 92, 94-96, 106-108 and 110 are rejected under 35 U.S.C. 102(b) as being anticipated by Honda et al. (JP 2001-335385) as evidenced by DeFord (US Pub 2002/0139082).

Regarding claim 76: Honda et al. teach an engineered (constructed) cement composite product (0008-0009). The product comprising a fiber reinforced cement board having a first major surface, a second opposing major surface (Figures, 0009-0010) and a sealer on the first and second major surface (0008). Honda teaches that the surface sealer has a thickness of 25 to 35 micrometers (0018-0019).

Regarding the sealer being "carbonation reducing", the examiner notes that one having ordinary skill would expect that a material forming a seal and blocking environmental conditions from reaching another material similar to that taught by Honda would have some degree of carbonation reduction. Specifically, components in the environment known in the art to cause carbonation would have to travel through the sealers before reaching the cement and therefore, the sealers would be reducing the speed of carbonation. Therefore, Honda's sealers on the first and second major surface are considered carbonation reducing. Additionally, Honda teaches that the sealers aid in prevention of carbonation (0003) making them both carbonation reducing.

Honda does not explicitly disclose the sealer and cement interacting to form an inter-penetrating network as claimed but the examiner notes the following. It is well known in the art that every material has some degree of porosity and Honda applying their sealers to a cement would cause one having ordinary skill to expect that the sealers would at least penetrate the cement to some extent into the cement thereby

forming an inter-penetrating network. Additionally, Honda is teaching their fiber reinforced cement is made using an aqueous slurry comprising cement, filler, powder, etc. which is then dried (0017) and according to DeFord, fiber reinforced cement made similarly (DeFord 0037-0055) has at least some porosity large enough to be penetrated (DeFord 0100). Therefore, one having ordinary skill would reasonably expect Honda's sealers to penetrate (interact) with the cement board and form an inter-penetrating network into the cement absent an evidentiary showing to the contrary

There is no explicit teaching that forming this network is to reduce carbonation and control carbonation gradient as claimed but these are intended use limitations which provide no structural difference apart from the inter-penetrating network. If the prior art product is the same as applicants', it only has to be capable of the claimed use. In the instant case, as Honda is expected to have the same inter-penetrating network which allows for applicants use as claimed, Honda is expected to have the same capabilities as claimed.

Regarding claim 79-81 and 82: Honda et al. teach that at least their surface sealer is an acrylic resin (0013) which is the same as applicants' disclosed and claimed radiation curable sealer curing with infrared (thermally cured), etc.. Therefore, Honda's acrylic sealer is expected to meet claims 79 through 82.

Regarding claims 83, 85-86, 92, 94 and 95: The examiner notes that "integral" is defined as something that is necessary for completeness (ie: something that is used to form the whole). In the instant case, Honda is teaches that the sealers are bonded to the surface of the board (Figures, 0008-0010) and this clearly suggest that the sealers

must have some degree of adhesion promotion itself. Additionally, Honda even teaches that the underlying sealer is silane (examples) which is the same as applicants' adhesion promoting formulation (applicants' pub 0082). As the adhesion formulation forms the whole sealer, the sealer is considered to be an integral adhesion promoting formulation as claimed.

The sealer applied to both surfaces are of different formulations (0008-0010). Again, the underlying sealer is made with silane which is the same as applicants' adhesion promoting formulation. Honda does not clearly discuss this adhesion promoting material adapted to enhance bonding of a topcoat but as it is the same as applicants', one having ordinary skill would expect the same capabilities to be obtained.

Again, as Honda's sealer appears to be the same as claimed, it would be expected to have the same properties. Therefore, Honda's sealer is expected to be alkali resistant and flexible in the cured state. Applicants' claim 95 is an intended use claim as it recites the use of the chosen sealer and/or structure of a cured product which does not provide patentable weight as long as the prior art products are capable of such use. In the instant case, as Honda's sealer and product appear to be the same as applicants' and Honda additionally teaches reducing carbonation, Honda's selected sealer and/or structure is expected to have the capability of reducing propensity for carbonation as claimed.

Regarding claim 96: Honda teaches an example of the product with a cement to silica ratio of 1.11 (0017).

Regarding claims 106 and 107: Claims 106 and 107 are product by process claims as they recite how the product is formed. However, process limitations in such claims do not provide patentable weight unless a new and unexpected result occurs and if the prior art product anticipates or is obvious over that claimed even if made by a different process, the claim is met. In the instant case, Honda's product is the same as claimed meeting claims 106 and 107.

Regarding claims 108 and 110: Honda's product is a sheet (Figures). The examiner points out that claim 108 is an intended use claim as it recites the intended use for the cement sheet and the prior art product only has to have the capability. As Honda's cement sheet is the same as claimed, it would be expected to have the same capability of use. Additionally, Honda clearly teaches the sheet being used for sheathing (ie: siding) (0015) which is known in the art to be an external cladding application.

Claim 110 is also intended use as it recites the use of both surfaces being either a mounting and/or exposed surface with a certain orientation. Specifically, the product is just a cement sheet as claimed in claim 76 and is not yet used as a cladding thereby, not yet mounted or exposed. Therefore, Honda's product only has to be capable of the claimed uses. As Honda teaches the same sheet as claimed, it would be expected to have the same use capability. Additionally, Honda teaching the sheet being used for sheathing (ie: siding) would cause one having ordinary skill in the building art to expect one major surface of Honda's sheet to be a mounting surface for inward orientation against a wall and the other would be exposed to the outer environment.

2. Claims 76, 78-81, 83-85, 88-89, 92, 95, 106-109 and 110 are rejected under 35 U.S.C. 102(b) as being anticipated by DeFord et al. (US Pub. 2002/0139082)

Regarding claim 76: DeFord et al. teach an engineered (constructed) cement composite product (abstract, 0033-0092). The product comprising a core board having a first major surface, a second opposing major surface (Figures) and the core board can comprise fiber reinforced cement (0031, 0079, 0086-0087).

The product also comprises a facing applied to at least the first and second major surfaces of the core board (Figures). The facing provides the core board with moisture resistance, barrier to water permeability, etc. (0017, 0092-0100, 0184). As the facings are blocking moisture, permeation, etc. to the core, the facing is considered to correspond to a sealer as claimed. The facing "sealer" has an overall thickness of 1/8 inch or less (3175 micron or less) (abstract) and DeFord teaches with sufficient specificity a thickness of 0.068 inch (1727.2 micron) thick (Table 1)

DeFord teaches that the facing (sealer) and the cement core board are made to intermingle and form a mutually inter-penetrating bonding interface network by co-curing the core and facings together (0017, 0098-0097). As this inter-penetrating interface will include an overlapping region comprising the facing (sealer) material commingled with cement material surface, DeFord's teaching meets applicants' limitation of the facing (sealer) forming an inter-penetrating network in the cement surface.

DeFord does not explicitly teach the facing (sealer) being "carbonation reducing' or the inter-penetrating network is to reduce differential carbonation and control carbonation gradients in the core cement board but the examiner notes the following.

Regarding the facing being "carbonation reducing", as DeFord's facing is sealing and covering the cement, for the same reasons provided above, one having ordinary skill would expect that the mere presence of the material will reduce speed of carbonation. Additionally, DeFord teaches that the facing comprises additives including acrylic resins (0045) which is the carbonation reducing sealer of applicants' (see applicants' claim 82). Therefore, DeFord's facings (sealers) are expected to be carbonation reducing.

Also, a greater indication that the sealer will be carbonation reducing is as follows regarding the limitation that the inter-penetrating network is to reduce differential and control gradient carbonation in the cement board. The examiner points out that although the limitation of obtaining an inter-penetrating network is "to reduce carbonation, etc." as claimed is intended use and does not have to be taught if the prior product has the capability, applicants are indicating that the inter-penetrating limitation is capable and results in reduced carbonation and controlling gradient. As DeFord's inter-penetrating network seems to be the same, one having ordinary skill would expect it to have the same capabilities and results of carbonation reduction absent an evidentiary showing to the contrary.

Regarding claims 78-80 and 81: DeFord teaches that the facing (carbonation reducing sealer) is applied to all surfaces of the core and therefore, all surfaces of the product (Figure 7D, 0104). The facing (sealer) can be cured at elevated temperatures (0092) which is known as thermal curing using heat (infrared).

Regarding claims 83-85, 88 and 89: The facing (sealer) includes a binder and therefore, has an adhesion promoting formulation therein (0039-0043). As the binder is used to form the completion of the sealer, it corresponds to an integral adhesion promoting formulation. The facing (sealer) applied to each major surface can be composed of the same formulation or different formulations (Figures, 0090, 0104).

DeFord teaches that the facing (sealer) can be formed (applied) on the core board in multiple curing stages (0094) meeting claims 76, 88 and 89. Additionally, DeFord teaches that the facing (sealer) can be formed (applied) on the board with multiple interlayers in between (0035, 0095, 0099). As the interlayers and the outer facing layer both cover and seal the core, the overall multiple coating laminate will be considered a sealer itself. Also, as this laminate sealer comprises the facing involved in the interpenetrating network with the cement as claimed, the overall laminate sealer meets the sealer limitations of both claims 76 and 88.

Regarding claims 92 and 95: DeFord teaches that the facing (sealer) is made to withstand and resist alkali environments (0045, 0095) corresponding to the facing (sealer) being alkali resistant as claimed.

Applicants' claim 95 limitation that one or more of the sealer and physical structure of a cured product are selected "to reduce propensity for carbonation" is intended use as discussed. As DeFord's facing (sealer) and structure is the same as claimed, it would be expected to have the same capability as claimed absent an evidentiary showing to the contrary.

Regarding claims 106-109 and 110: Claims 106 and 107 are product by process claims and DeFord only has to teach a product. In the instant case, DeFord's product is the same as in applicants' claims thereby meeting the claims. However, DeFord additionally teaches that the product can be made using the Hatschek or extrusion process (0056, 0060, 0072, 0079, 0093, 0154) meeting the claimed process steps.

As also maintained above, applicants' claim 108 is an intended use claim and DeFord only needs to teach a product having the capability. DeFord teaches that the cement product is in sheet form (Figures, 0016, 0039-0145) and as this is applicants' claimed product structure, one having ordinary skill would expect DeFord's cement to have the same capability of use as an exterior cladding (Figures, 0016, 0039-0145). DeFord does clearly teach that the cement sheet is used as an exterior cladding thereby meeting applicants' claim. DeFord's sheet is rectangular and the facing (sealer) is applied to all surfaces of the cement core (Figure 7D, 0104).

Claim 110 is also an intended use claim and DeFord's product only has to be capable of the claimed use. As DeFord's cement sheet is the same as applicants, it would be expected to have the same capabilities. Additionally, DeFord does teach that the rectangular cement sheet used for exterior cladding is specifically for building siding, sheathing, wall board, etc. (Figures, 0016, 0039-0145). It is known in the art of building that these sheets will be applied in a vertical manner with the ends facing up and does and one main face of the sheet will be for mounting inward against a wall and the other main face will be outward and exposed to the environment as claimed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 87-88, 97-98 and 99 are rejected under 35 U.S.C. 103(a) as being obvious over Honda et al. (JP 2001-335385) as applied to claim 76.

Regarding claims 87-88: Honda does not disclose a separate keycoat adapted to enhance bonding of a topcoat covering at least one of the sealed faces or the sealer being applied in multiple coats but the examiner notes that this is just duplication of parts which provides no patentable weight.

For instance, regarding claim 88, one having ordinary skill in the art of coatings would know that multiple coats would be desirable in order to increase thickness, coverage, strength, repair chipped surfaces, etc.. For example, much like painting a wall, often more than one coat of the same material is necessary in order to obtain desired coverage and thickness. In the instant case, as Honda's surface sealer on the face is for reducing carbonation and weathering, one having ordinary skill would desire enough coverage to obtain prevention of carbonation but also increasing the number of coats will desirably increase the thickness of the carbonation barrier. Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to modify Honda to include applying the acrylic surface sealer in multiple coats to obtain desired coverage, thickness, etc. thereby desired level of carbonation prevention.

Regarding claim 87, applying Honda's acrylic sealer in multiple coats will necessarily at least provide a first acrylic sealer coat and a second acrylic sealer coat (key coat) covering the first. As acrylic is the same as applicants' disclosed bonding enhancement formulation, it would be expected by one having ordinary skill that this second coating (key coat) will enhance bonding of a top coat if applied.

Regarding claims 97-99: Honda also teaches that the product can have 35 to 60wt% cement and 20 to 60 wt% silica (0010) which provides cement to silica ratios overlapping applicants' claimed ranges. It would have been obvious to one having ordinary skill in the art at the time of invention to choose any cement to silica ratio provided by Honda's content ranges in order to obtain a desired cement product.

4. Claims 78, 89-91, 101-105, 111-113 and 114 are rejected under 35 U.S.C. 103(a) as being obvious over Honda et al. (JP 2001-335385) as applied to claims 76 and 108, in view of DeFord (US Pub 2002/0139082) as evidenced by Absolute Astronomy (http://www.absolute astronomy.com/topics/Perlite).

Regarding claims 78 and 109: Honda fails to teach the sealer applied to all surfaces of the product. However, Honda teaches that the sealers are used for weathering prevention (0001-0010) and it is known and desired in the art to obtain weathering resistance on all surfaces of cement. For example, DeFord teaches weather resistant facings on all surfaces of a cement core board (Figure 7D, 0112 and 0121)

Honda and DeFord disclose analogous inventions related to weather resistant materials on a cement board. Although Honda and DeFord teach differing weather resistant materials, DeFord is clearly teaching that it is beneficial to obtain a weather

resistant material on all surfaces. Therefore, one having ordinary skill would find it beneficial to place Honda's resistant material on all surfaces of their cement core. It would have been obvious to one having ordinary skill in the art at the time of invention to modify Honda to include the weather resistant sealer on all surfaces of the cement in order to provide enhanced weathering prevention.

Regarding claims 89-90 and 91: Honda fails to teach the sealer cured in multiple stages but DeFord teaches that partially curing a weather resistant material, applying said partially cured material to another material and then fully curing the overall product allows for enhanced bonding (DeFord 0093-0096).

While Honda's and DeFord's materials differ, the concept of enhanced bonding would be well desired in the art and as both teach curable weather resistant materials on similar cement, one having ordinary skill would have found DeFord's multiple curing process to be obvious within Honda. It would have been obvious to one having ordinary skill in the art at the time of invention to modify Honda to include partially pre-curing the sealer, applying the sealer to the cement and then finally curing the overall product to enhance bonding between materials.

Honda fails to teach the application of another coating on the sealer on at least one of the faces and then obtaining multiple curing steps for increased bonding as claimed but as above, an additional coating is duplication of parts which is obvious to enhance thickness and coverage and multiple curing steps as claimed is beneficial in enhancing bonded. It would have been obvious to one having ordinary skill in the art at the time of invention to duplicate the sealer and add multiple coats (ie: atleast the first

sealer and then a second sealer corresponding to the claimed keycoat and topcoat) thereon in order to increase thickness and full coverage and partial curing occurs prior to full curing in order to enhance bonding.

Regarding claims 101-102 and 103: Honda fails to teach their product porosity.

However, DeFord teaches that it is beneficial to obtain fiber cement products according to their invention in order to obtain lighter weight and durable building products (0003-0017, 0077). Both Honda and DeFord teach cements for building products and as DeFord indicates their light cement being preferable, it would have been obvious to one having ordinary skill in the art at the time of invention to modify Honda to include the cement of DeFord in order to obtain a light and durable building product.

DeFord's cement is substantially core with fiber skins thereon. The core has a porosity of 10 to 90% and fiber skins in which have closing porosity (not substantially porous) (DeFord 0003-0017, 0077). As DeFord suggest that the majority of the cement is core and the core obtains almost all the product porosity, one having ordinary skill would take DeFord's teaching to be indicating a cement product porosity of about 10 to 90%. Additionally, even in the instance it is determined that the facings have some degree of porosity, as they are thin and do not form a substantial part of the product, one having ordinary skill would not expect the porosity to change much, if at all, from 10 to 90%. This range overlaps applicants' range and it would have been obvious to one having ordinary skill to choose any porosity in the above range to obtain desired cement weight.

Regarding claims 104 and 105: DeFord does not explicitly teach the density of the overall cement product now within Honda, but DeFord is teaches that the main goal of the cement is to obtain a light weight product with a density similar to lumber which is 0.38 to 0.9 (0006-0016). Therefore, although a specific density value for their finally produced product, one having ordinary skill would expect a density of 0.38 to 0.9 to be obtained in Honda overlapping applicants' range. It would have been obvious to one having ordinary skill in the art at the time of invention to choose any density within the 0.38 to 0.9 range in order to obtain a suitable light weight cement.

In the instance the final product density is not necessarily in the above range, DeFord teaches that the density of a cement product can be adjusted using density modifiers as desired (DeFord 0016, 0045, 0054, 0087) and that 0.38 to 0.9 density is beneficial for obtaining a light weight and durable cement product (DeFord 0006). As DeFord teaches a result effective relationship, one having ordinary skill would know that density modifiers and amount thereof can be optimized to any value and through routine experimentation the desired density results can be obtained. Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to modify Honda to include and optimize density modifiers and amount thereof to any value in order to obtain a density of 0.38 to 0.9 and a light weight, durable cement product in. Again, this range overlaps applicants and it would have been obvious to one having ordinary skill in the art at the time of invention to choose any density within the 0.38 to 0.9 range in order to obtain a suitable light weight cement

Regarding claim 111: Honda was modified to include cement product including a first major surface which is expected to have reduced propensity to differential carbonation by application of multiple coatings of a carbonation reducing sealer. This will necessarily provide a first sealer and a second sealer (keycoat) coating.

Honda's cement board has cement to silica ratios overlapping applicants' range and it would have been obvious to one having ordinary skill at the time of invention to choose any cement and silica content to obtain desired cement.

Also, Honda teaching the cement board from DeFord, DeFord teaches that their core comprises 10 to 100wt% cement and 0 to 80% perlite filler (70 to 75% silica as evidenced by Absolute astronomy) (DeFord 0080-0087) and the facings have 10 to 80% cement and 0 to 80% silica) (DeFord 0039-0051). As both the core and facings each have cement to silica ratio ranges overlapping applicants', one having ordinary skill would expect the overall product to also have a cement to silica ratio overlapping applicants' claimed range. It would have been obvious to one having ordinary skill to choose any cement and silica content in Honda to obtain a desired cement.

Regarding claims 112-113 and 114: Honda also now includes DeFord's method of pre-curing any material to be applied, which would include the keycoat in this instance, adding it to another and then finally curing the product to enhance bonding.

Also, Honda's sealer is the same as applicants and therefore would be a radiation curable sealer and Honda now includes the concept of applying the sealer to all surfaces as taught by DeFord.

5. Claims 96-105, 111-113 and 114 are rejected under 35 U.S.C. 103(a) as being obvious over DeFord et al. (US Pub. 2002/0139082) as applied to claim 76 as evidenced by Absolute Astronomy (http://www.absolute astronomy.com/topics/Perlite).

Regarding claims 96-99 and 100: DeFord's product comprising the facings (sealer) and the core can have 10 to 80 % cement and 0 to 80 % silica filler (0039-0044) in the facings and 10 to 100% cement and 0 to 80% perlite (perlite is 70 to 75% silica as evidenced by absoluteastronomy.com) filler (0081-0087) in the core. As each of the facings and core include cement to silica ratios overlapping applicants' as claimed, one having ordinary skill would expect the overall product to also include a cement to silica ratio overlapping applicants claimed ranges. It would have been obvious to one having ordinary skill in the art at the time of invention to choose any amount of cement and silica, thereby any ratio thereof, within DeFord's product to obtain suitable cement product.

Regarding claims 101-102 and 103: DeFord et al. teach that product comprising the facing (sealer) and core has a core porosity of 10 to 90% or more (0077). DeFord does not explicitly teach the level of porosity provided by the facings (sealer) to provide an overall product porosity but as maintained, it would be expected by one having ordinary skill that the product will obtain a porosity of or about 10 to 90% which overlaps applicants' claimed ranges. It would have been obvious to one having ordinary skill to choose any porosity within DeFord to obtain a suitable cement product.

Regarding claims 104 and 105: DeFord does not explicitly teach the density of the overall product but as above, DeFord teaching their main goal is to obtain a light weight

product with a density similar to lumber which is 0.38 to 0.9 (0006-0016) would cause one having ordinary skill to expect a product density of 0.38 to 0.9 to be obtained. This range overlaps applicants' and it would have been obvious to one having ordinary skill in the art at the time of invention to choose any density within the 0.38 to 0.9 range in order to obtain a suitable light weight cement.

In the instance the final product density is not necessarily in the above range, DeFord teaches that the density of the product can be adjusted using density modifiers as desired (0016, 0045, 0054, 0087) and that 0.38 to 0.9 density is beneficial for obtaining a light weight and durable cement product (0006). As DeFord teaches a result effective relationship, one having ordinary skill would know that density modifiers and amount thereof can be optimized to any value and through routine experimentation the desired density results can be obtained. It would have been obvious to one having ordinary skill in the art at the time of invention to optimize the density modifiers and amount thereof to any value in order to obtain a density of 0.38 to 0.9 and a light weight, durable cement product. Again, this range overlaps applicants and it would have been obvious to one having ordinary skill in the art at the time of invention to choose any density within the 0.38 to 0.9 range in order to obtain a suitable light weight cement.

Regarding claim 111: DeFord teaching an engineered fiber reinforced cement including a first surface which is expected to have reduction for carbonation provided by a carbonation reducing sealer. The product has overlapping cement to silica ratios and porosity and it would have been obvious to one having ordinary skill to choose any cement, silica and porosity values to obtain desired results. Additionally, it was obvious

to include in DeFord that the sealer can be added in multiple coats to obtain desired thickness and coverage thereby meeting the claimed keycoat.

Regarding claims 112-113 and 114: Also, DeFord teaches the process of partially curing curable materials, applying them and then fully curing allows for enhanced bonding. Therefore, in the application of multiple sealer coats, applicants' claimed processing would have been obvious within DeFord to obtain desired bonding.

DeFord's sealer is applied to all surfaces and is comprised of a radiation curable acrylic as above.

6. Claims 76-84, 86-88, 92-100, 106-109 and 110 are rejected under 35 U.S.C. 103(a) as being obvious over Yonekawa (JP 05/287234) in view of Honda et al. (JP 2001-335385).

Regarding claims 76, 77 and 78: Using the human English translation, Yonekawa teach an engineered (constructed) cement product (0001). The product comprising a cement body (0001, examples) and a sealer applied to a first major surface of cement body (0007-0010). The cement and the sealer interact with one another to form an interpenetrating network extending into the surface of the cement (0007-0010).Yonekawa does not explicitly teach the sealer being "carbonation reducing' or the inter-penetrating network is to reduce differential carbonation and control carbonation gradients in the cement but the examiner notes the following.

Regarding the sealer being "carbonation reducing", as the material forms a seal and blocks environmental conditions from reaching another material, it would be expected to have some degree of carbonation reduction. Additionally, Yonekawa

teaches the sealer including acrylic resins (0011) which the same as applicants' carbonation reducing sealer (see applicants' claim 82). Applicants also disclose that the sealer forming an inter-penetrating network similar to Yonekawa results in carbonation reduction. Further, the examiner also points out that Yonekawa teaches the sealer is a neutralization and carbon dioxide reducing sealer (0004, 0009, examples) and it is known that without carbon dioxide, there will be no carbonation clearly evidenced by Honda (Honda 0003). Therefore, Yonekawa's sealer reducing carbon dioxide will result in the sealer being a carbonation reducing sealer.

Regarding the limitation that the inter-penetrating network is to reduce differential carbonation and control gradient carbonation in the cement board. This limitation is intended use Yonekawa's product only has to be capable of the claimed use. As Yonekawa's inter-penetrating network seems to be the same as claimed, one having ordinary skill would expect it to have the same capabilities absent an evidentiary showing to the contrary. Additionally, Yonekawa clearly teaches that the sealer and inter-penetrating network is meant to reduce carbon dioxide in the cement (0009) and as this is considered to reduce carbonation for reasons above, it is expected that the network will reduce differential carbonation thereby control it in the claimed manner.

Yonekawa fails to teach the cement being fiber reinforced having a first and along with second major surface. However, Honda teaches that reducing carbon dioxide on fiber reinforced cement boards having first and second opposing surfaces is beneficial for sheathing, wall board, etc. (0003, 0008-0010). Yonekawa and Honda disclose analogous inventions related to sealers on cement for reducing carbon dioxide

effects. As Honda indicates using a fiber reinforced cement is beneficial for the carbon dioxide environmental conditions, it would have been obvious to one having ordinary skill in the art at the time of invention to modify Yonekawa to include the cement being fiber reinforced in order to obtain a stable sealed cement sheathing and wall board products.

Yonekawa fails to teach the thickness of the claimed sealer but the examiner notes that thickness is result effective which is known to change physical properties such as strength, etc. One having ordinary skill would know that the thickness can be optimized to any value and through routine experimentation, desired results can be obtains. Additionally, Yonekawa is teaching that their sealer composition is used to replace typical acrylic compositions used as sealers for surface enhancement, etc. of cement. One having ordinary skill would reasonably expect that since Yonekawa' is only replacing the composition of typical acrylic sealers, that the physical structure such as thickness, etc. would still be expected to be similar. Specifically, Honda teaches that typical acrylic sealers used for surface enhancement of cement are known to have thicknesses of 25 to 35 microns (Honda 0001-0005, 0018). Therefore, obtaining a thickness of Yonekawa's sealer being 25 to 35microns would be within routine experimentation. It would have been obvious to one having ordinary skill in the art at the time of invention to modify Yonekawa to optimize the sealer thickness to any value including 25 to 35 microns in order to obtain a desired sealer for cement.

Yonekawa fails to teach the above sealer being applied to first and second surfaces but the examiner notes that this is duplication of parts which provides no

patentable weight unless a new and unexpected result occurs. Specifically, one having ordinary skill would know that applying the carbon dioxide sealer to all major surfaces of the cement board, the effect can be provided to all said surfaces. Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to modify Yonekawa to include the sealer on the first and second major surfaces of the cement board in order to impart carbon dioxide reduction on all surfaces.

Regarding claims 79-81 and 82: Yonekawa's sealer is an acrylic sealer (0011-0012) and as this is what applicants disclose an a radiation curable sealer, curable in the infrared (thermally cured), etc., Yonekawa meets claims 79 through 81.

Regarding claims 83-84, and 86: Yonekawa's sealer includes silanes (0040) which is applicants' claimed adhesion promoting formulation. As the silane forms part of the whole sealer, it corresponds to an "integral" adhesion promoting formulation as claimed. As the formulation "to enhance bonding of a topcoat" is intended use, Yonekawa's product only has to be capable of the claimed use. In the instant case, as the adhesion formulation is the same as applicants', it would be considered to function as claimed.

Yonekawa duplicating the sealer on all surfaces corresponds to the sealers being substantially the same formulation.

Regarding claims 87-88: Yonekawa does not disclose a separate keycoat adapted to enhance bonding of a topcoat covering at least one of the sealed faces or the sealer being applied in multiple coats but the examiner notes that this is just duplication of Yonekawa's sealer which provides no patentable weight.

Regarding claim 88, one having ordinary skill in the art of coating would know that multiple coats of the sealer would be desirable in order to increase thickness, coverage, strength, repair chipped surfaces, etc.. Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to modify Yonekawa to include applying the acrylic surface sealer in multiple coats to obtain desired coverage, thickness, etc. thereby desired level of carbonation prevention.

Regarding claim 87, applying Yonekawa's acrylic sealer in multiple coats will necessarily at least provide a first acrylic sealer coat and a second acrylic sealer coat (key coat) covering the first. As acrylic is the same as applicants' disclosed bonding enhancement formulation, it would be expected by one having ordinary skill that this second coating (key coat) will enhance bonding of a top coat if applied.

Regarding claims 92-93 and 94: Yonekawa teaches their sealer being polymerically cross-linked and their sealer is carbon dioxide resistant. This indicates their sealer will be cross-linked sufficiently to impede migration of carbon dioxide as claimed. Also, as the acrylic sealer is the same material as claimed by applicants', it would be expected to be flexible in the cured state as claimed.

Regarding claim 95: Applicants' claim 95 limitation that one or more of the sealer and physical structure of a cured product are selected "to reduce propensity for carbonation" is intended use and the sealer and/or structure of Yonekawa only has to be capable of the claimed use. As Yonekawa's sealer and the structure are the same as claimed, it would be capable of reducing carbonation in the product.

Regarding claims 96-99 and 100: Yonekawa including the cement board of Honda obtains a cement product comprising 35 to 60wt% cement and 20 to 60 wt% silica (Honda 0010) which provides for cement to silica ratios overlapping applicants' claimed ranges. It would have been obvious to one having ordinary skill in the art at the time of invention to choose any cement to silica ratio provided by Honda's content ranges in order to obtain a desired cement product.

Regarding claims 106-109 and 110: Claims 106 and 107 are product by process claims and as long as Yonekawa's product meets the product claimed, the claims are met. In the instant case, as Yonekawa's modified structure is the same as applicants', it is expected to meet the product of claims 106 and 107.

Also, Yonekawa including the cement of Honda is the structure of a rectangular sheathing sheet and the entire structure surface is coated with the sealer. Claims 108 and 110 are intended use claims as they recite the sheet being used for an external cladding and the used of each surface of the cement and the prior art product only has to be capable of the use. As Yonekawa's structure is the same as claimed, it is expected to be capable of the same use. Additionally, a sheathing (ie: siding) as now in Yonekawa is known in the art to be used as exterior cladding wherein one surface is mounted inward on a wall and the other is exposed to an external environment, Yonekawa's structure meets the claims.

7. Claims 85, 89-91, 101-104 and 105 are rejected under 35 U.S.C. 103(a) as being obvious over Yonekawa (JP 05/287234) and Honda et al. (JP 2001-335385) as applied to claim 76, in view of DeFord (US Pub 2002/0139082).

Regarding claim 85: The combination of Yonekawa and Honda teach applicants' claim 76 and the carbonation reducing sealer discussed for claim 76 is applied to all surfaces by duplication of parts indicating the same formulation.

While the combination does not include the sealer on at least the first and second major surfaces having different formulations, this would have been obvious. Specifically, DeFord teaches that the same weather resistant layer can be applied to all cement surfaces similar to above or one can add weather resistant layers on all surfaces with the first and second major surfaces being different depending on desired weathering results. This indicates that although Yonekawa was modified to duplicate the weather resistant sealer on all surfaces, DeFord's teaching provides suggestion that the weather resistant sealer of Yonekawa can still be applied to all surfaces as in claim 76 but the formulations can be made different on the first and second surface as in claim 85.

Additionally, it would be known how to obtain this different formulation as Yonekawa teaches listings of different compounds and ranges of materials which are suitable and one having ordinary skill would know to optimize the material choice and content in each layer to obtain any desired differing formulations. Therefore, it would have been obvious to one having ordinary skill at the time of invention to modify Yonekawa to include making the sealer on the first and second surfaces different formulations to obtain desired weathering.

Regarding claims 89-90 and 91: Yonekawa fails to teach the sealer cured in multiple stages but according to DeFord, partially curing a weather resistant material, applying

said partially cured material to a cement and then fully curing the overall product allows for enhanced bonding between said material and cement (DeFord 0093-0096).

While Yonekawa's and DeFord's weather resistant materials differ, the concept of enhanced bonding would be well desired in the art and as both teach curable weather resistant materials on similar cement, one having ordinary skill would have found DeFord's multiple curing process to be obvious within Yonekawa. It would have been obvious to one having ordinary skill in the art at the time of invention to modify Honda to include partially pre-curing the sealer, applying the sealer to the cement and then finally curing the overall product to enhance bonding between materials.

Yonekawa fails to teach the application of another coating on the sealer on at least one of the faces and then obtaining multiple curing steps for increased bonding as claimed but as above, an additional coating is duplication of parts which is obvious to enhance thickness and coverage and multiple curing steps as claimed is beneficial in enhancing bonded. Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to duplicate the sealer and add multiple coats (ie: atleast the first sealer and then a second sealer corresponding to the claimed keycoat and topcoat) thereon in order to increase thickness and full coverage and partial curing occurs prior to full curing in order to enhance bonding of materials.

Regarding claims 101-102 and 103: Yonekawa includes the cement of Honda but Honda fails to teach their fiber cement porosity.

However, DeFord teaches that it is beneficial to obtain fiber cements according to their invention in order to obtain lighter weight and durable building products (0003-

0017, 0077). As both Yonekawa and DeFord teach cements for building products and DeFord indicates their light cement being preferable, it would have been obvious to one having ordinary skill in the art at the time of invention to modify Yonekawa to include the cement of DeFord in order to obtain a light and durable building product.

DeFord's cement is substantially core with fiber skins thereon and DeFord's product is expected to have a porosity of at or about 10 to 90% for the reasons above. This range overlaps applicants' range and it would have been obvious to one having ordinary skill to choose any porosity In the above range to obtain desired cement weight.

Regarding claims 104 and 105: DeFord does not explicitly teach the density of the overall cement which is now within Yonekawa, but DeFord is teaches that the main goal of the cement is to obtain a light weight product with a density similar to lumber which is 0.38 to 0.9 (0006-0016). Therefore, one having ordinary skill would expect a density of 0.38 to 0.9 to be obtained in Yonekawa overlapping applicants' range. It would have been obvious to one having ordinary skill in the art at the time of invention to choose any density within the 0.38 to 0.9 range in order to obtain a suitable light weight cement.

In the instance the final product density is not necessarily in the above range, DeFord teaches that the density of a cement product can be adjusted using density modifiers as desired (DeFord 0016, 0045, 0054, 0087) and that 0.38 to 0.9 density is beneficial for obtaining a light weight and durable cement product (DeFord 0006). Therefore, one having ordinary skill would know that density modifiers and amount thereof can be optimized to any value and through routine experimentation the desired

density results can be obtained. It would have been obvious to one having ordinary skill in the art at the time of invention to modify Yonekawa to include and optimize density modifiers and amount thereof to any value in order to obtain a density of 0.38 to 0.9 and a light weight, durable cement product in. Again, this range overlaps applicants and it would have been obvious to one having ordinary skill in the art at the time of invention to choose any density within the 0.38 to 0.9 range in order to obtain a suitable light weight cement

8. Claims 111-113 and 114 are rejected under 35 U.S.C. 103(a) as being obvious over Yonekawa (JP 19931102) in view of DeFord (US Pub 2002/0139082).

Regarding claim 111: As maintained above, Yonekawa teaches a cement product including a first major surface with a reduced propensity for carbon dioxide wherein carbon dioxide is reduced by application of a carbon dioxide reducing sealer. Also, it was discussed that reducing carbon dioxide will reduce differential carbonation as carbon dioxide is needed for carbonation to occur. Therefore, the first major surface will have reduced propensity for carbonation and the reduction of carbonation is by a carbonation reducing sealer.

Yonekawa fails to teach the cement product being fiber reinforced cement and the product including cement to silica ratios and porosity as claimed but DeFord teaches that it is beneficial to obtain fiber cements according to their invention, which include overlapping ratios and porosities to that claimed, in order to obtain lighter weight and durable building products. As Yonekawa and DeFord disclose analogous inventions related to cement products provided with weathering resistance and DeFord indicates

their cement being beneficial, it would have been obvious to modify Yonekawa to include using the cement of DeFord in order to obtain a light weight and durable. Also, as the ratio of cement to silica and porosity of this product overlaps applicants, it would have been obvious to choose any content of cement, silica and porosity to obtain a desired cement.

Yonekawa fails to teach reducing in carbonation by a separate keycoat but this is merely duplication of Yonekawa's sealer which would have been obvious as adding additional sealer on top of the already laid on increases thickness and/or coverage. It would have been obvious to one having ordinary skill in the art at the time of invention to modify Yonekawa to include multiple sealers in order to increase thickness and/or coverage. This multiple sealer will necessarily form at least a first sealer and a second sealer (keycoat) and as both are the same carbonation reducing sealer formulation above, the claim is met.

Regarding claim 112: Yonekawa fails to teach the curing processing as claimed but as discussed, DeFord teaches that it is beneficial that a layer to be applied is first partially cured, applied and then the final product is fully cured to enhance bonding. As the keycoat sealer is to be applied to the underlying sealer in Yonekawa and DeFord teaches that the above process is beneficial, one having ordinary skill at the time of invention would have found it obvious to modify Yonekawa to include the keycoat being partially cured, applied and the fully cured to enhance bonding.

Regarding claim 113: Yonekawa fails to teach the sealer being applied to all surfaces of the product but this is merely duplication of the sealer which provides no patentable

weight. One having ordinary skill would know that carbon dioxide prevention can be obtained on all surfaces by applying the sealer on all surfaces and this would be desirable for increasing weather resistance. Additionally, DeFord also teaches that weather resistant materials can be applied to all surfaces of a cement as desired (DeFord Figures 0112-0121). Therefore, it would have been obvious to one having ordinary skill at the time of invention to modify Yonekawa to include the sealer on all surfaces of the product to increase weather resistance.

Regarding claim 114: Yonekawa's sealer is acrylic and as this is the same as applicants' radiation curable sealer, Yonekawa's sealer is expected to having the property as claimed in claim 114.

Response to Arguments

Upon further consideration of the prior art, applicant's arguments filed June 4, 2010 have been considered but are moot in view of the new ground(s) of rejection.

However, regarding the arguments that neither DeFord nor Yonekawa disclose a carbonation reducing sealer inter-penetrating the cement is not persuasive.

DeFord teaches a sealer which upon further consideration can be considered a carbonation reducing sealer. DeFord teaches that this sealer does inter-penetrate the cement.

Yonekawa, although the machine translation used terms like "membrane", etc. in which applicants' argue is a flat layer instead of an inter-penetrating network, this is not persuasive because the human translation does clearly teach the carbonation reducing sealer inter-penetrating the cement.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAUREN ROBINSON whose telephone number is (571)270-3474. The examiner can normally be reached on Monday to Thursday 6am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/LAUREN ROBINSON/
Examiner, Art Unit 1784

/Jennifer C. McNeil/
Supervisory Patent Examiner, Art Unit 1784